Portland Harbor CAG
Presentation by
The Lower Willamette Group

Feasibility Study Review and Process
February 10, 2010

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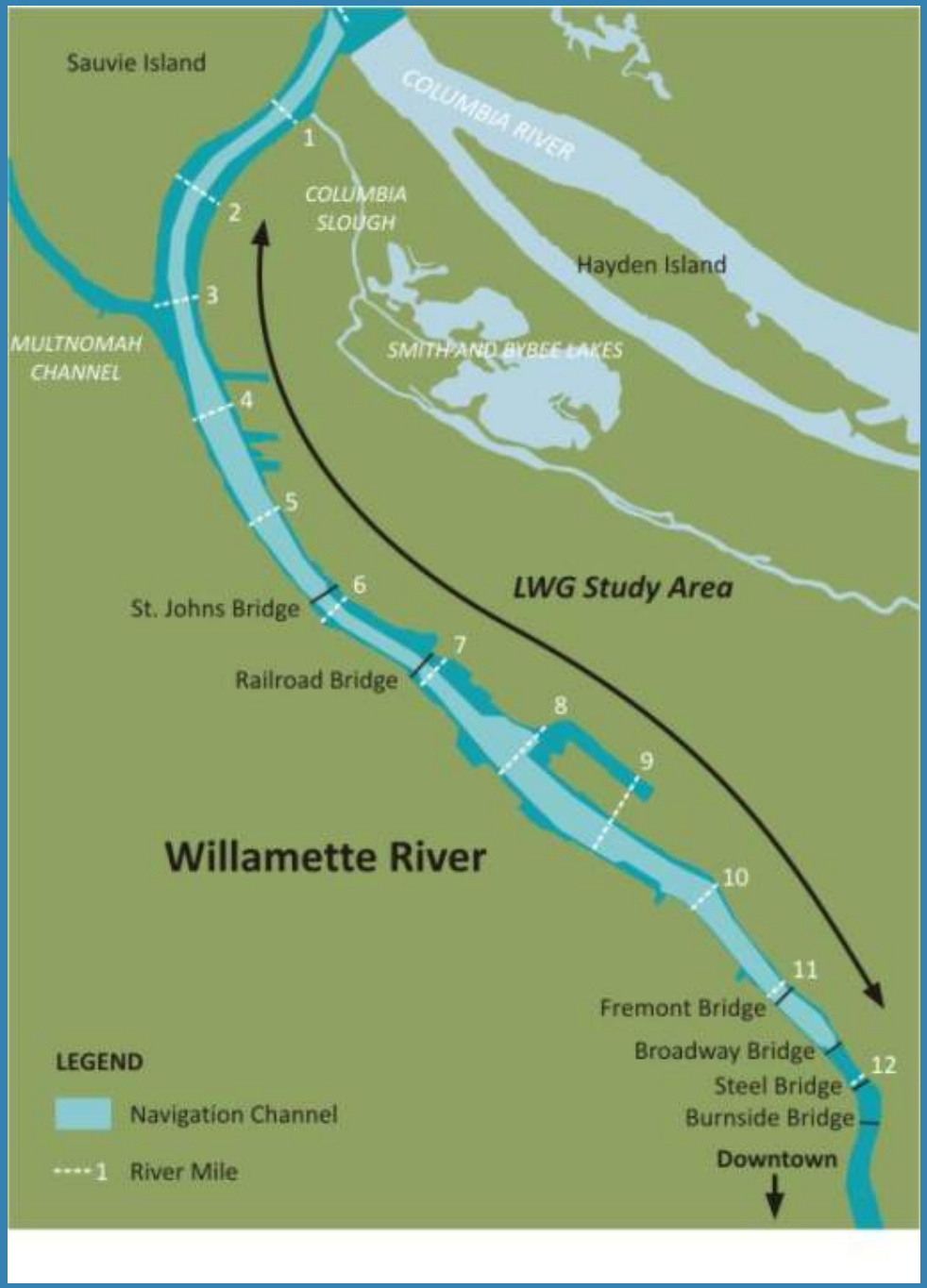
Portland Harbor Superfund Site

Study Area between Sauvie Island (RM 1.9) and the Broadway Bridge (RM 11.8)



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Presentation Outline

- Quick Review of Where We Are Today
- Feasibility Study
  - Remedial Action Objectives, Goals
    - Areas of Potential Concern
  - Remedial Options
  - Alternatives Analysis
- Post RI/FS process and public input opportunities

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Quick Review

- Draft Remedial Investigation Report (including risk assessments) submitted in 2009
- EPA and partners review underway
- Planning for FS began in 2009
- FS expected to be completed around the end of 2010 or early 2011
- FS to be followed by Record of Decision (ROD), in which the remedy will be selected

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Feasibility Study

- The FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions.
- Data collected in the RI influence the development of remedial alternatives in the FS.
- The ROD will be developed based on the FS and likely will select one of the remedial alternatives included in the FS.

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Feasibility Study - continued

- Feasibility Study Process establishes remedial options
- Feasibility Study Process DOES NOT:
  - Determine who cleans up what
  - Fully design remedies (*e.g.*, dredge or cap boundaries)
    - (Must have public input before remedy selection)
  - Select specific technologies (*e.g.*, bucket vs. hydraulic dredge)
  - Select contractors
  - Select specific disposal sites

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Key Terms used in this presentation

- COCs – Chemicals of Concern
- RAOs – Remedial Action Objectives
- AOPCs – Areas of Potential Concern
- PRGs – Preliminary Remediation Goals
- ARARs - Applicable or Relevant and Appropriate Requirements
- SMAs – Sediment Management Areas
- ROD – Record of Decision

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EPA Directed Remedial Action Objectives – Human Health

1. Reduce to acceptable levels human health risks from exposure to contaminated sediments resulting from incidental ingestion of and dermal contact with sediments, and comply with identified ARARs.
2. Reduce to acceptable levels human health risks from indirect exposures to COCs through ingestion of fish and shellfish that occur via bioaccumulation pathways from sediment and/or surface water and comply with identified ARARs.
3. Reduce risks from COCs in surface water at the site to acceptable exposure levels that are protective of human health risks from ingestion of, inhalation of, and dermal contact with surface water; protect the drinking water beneficial use of the Willamette River at the site; and comply with identified ARARs.
4. Reduce to acceptable levels human health risks resulting from direct exposure to contaminated groundwater and indirect exposure to contaminated groundwater through fish and shellfish consumption, and comply with identified ARARs.

EPA Directed Remedial Action Objectives - Ecological

1. Reduce to acceptable levels the risks to ecological receptors resulting from the ingestion of and direct contact with contaminated sediments and comply with identified ARARs.
2. Reduce to acceptable levels risks to ecological receptors from indirect exposures through ingestion of prey to COCs in sediments via bioaccumulation pathways from sediment and/or surface water and comply with identified ARARs.
3. Reduce risks from COCs in surface water at the site to acceptable exposure levels that are protective of ecological receptors based on the ingestion of and direct contact with surface water and comply with identified ARARs.
4. Reduce to acceptable levels the risks to ecological receptors resulting from the ingestion of and direct contact with contaminated groundwater and indirect exposures through ingestion of prey via bioaccumulation pathways from groundwater, and comply with identified ARARs.

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Preliminary Remediation Goals (PRGs)

- PRGs are concentrations in sediment or water that are expected to meet the RAOs.
- PRGs are determined based on the findings of the risk assessment.
- Per EPA guidance, PRGs are developed in an iterative process resulting in Remedial Goals (RGs) that will be used in the FS to evaluate cleanup alternatives.
- RGs used in the FS are not cleanup levels. Cleanup levels will be set by EPA in the Record of Decision.

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Areas of Potential Concern (AOPCs) for Further Evaluation in the FS

- AOPCs are broadly defined areas of sediments that exceed one or more PRGs.
- AOPCs do NOT represent areas that will require cleanup.
- AOPCs are used in identifying areas and volumes of sediment that will be the focus of further evaluation in the FS.
- AOPCs represent areas of risk only, they do not reflect other factors that may impact cleanup.

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EPA'S DRAFT AOPC MAPS

- EPA developed the following draft maps of possible AOPCs in the summer of 2009 – prior to reviewing the draft risk assessments.
- These draft AOPCs were not agreed to or jointly developed by the parties.
- LWG has agreed to consider the drafts for discussion purposes in the FS process, with the parties understanding that the size and scope of draft AOPCs will change with further evaluation in the FS process.

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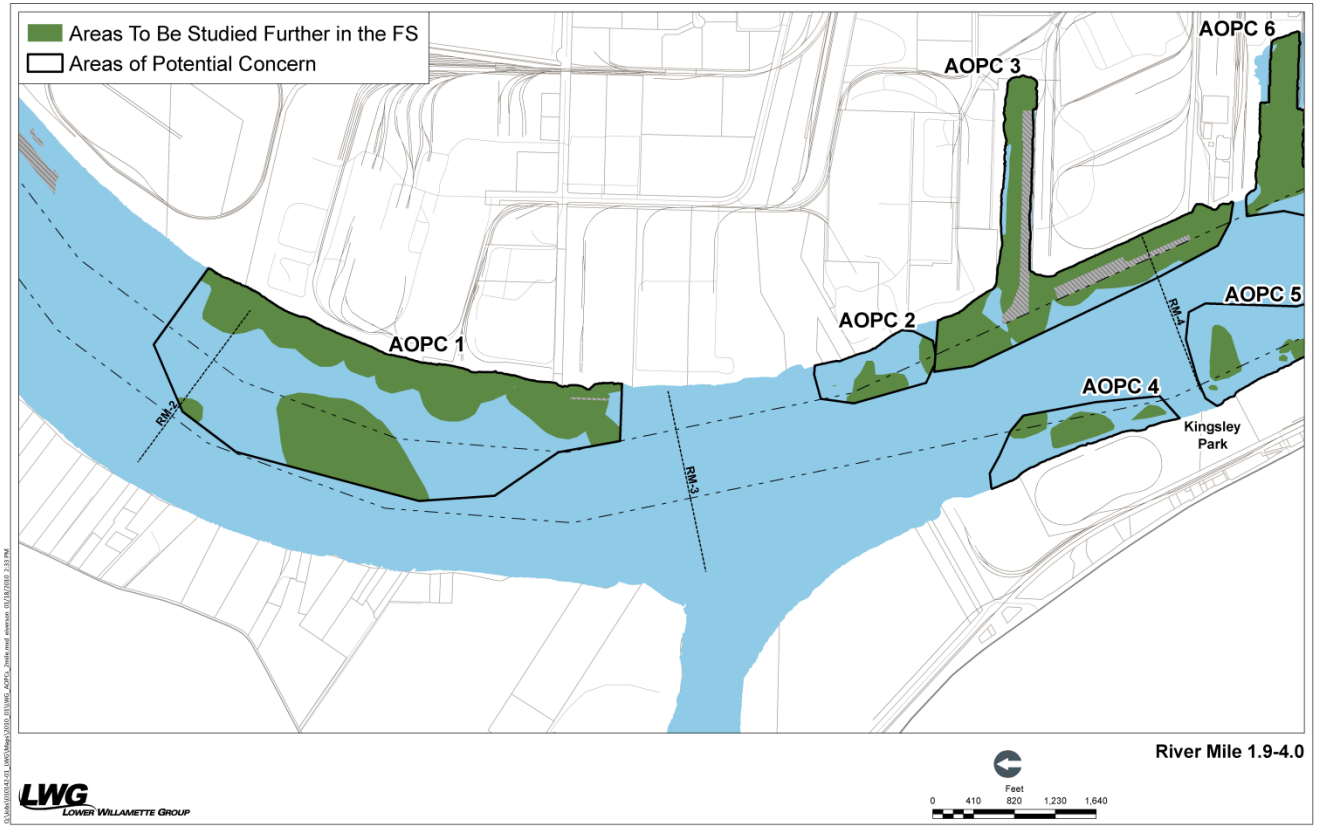
Draft EPA AOPC Map for Further Evaluation of RM 1.9 – 4.0



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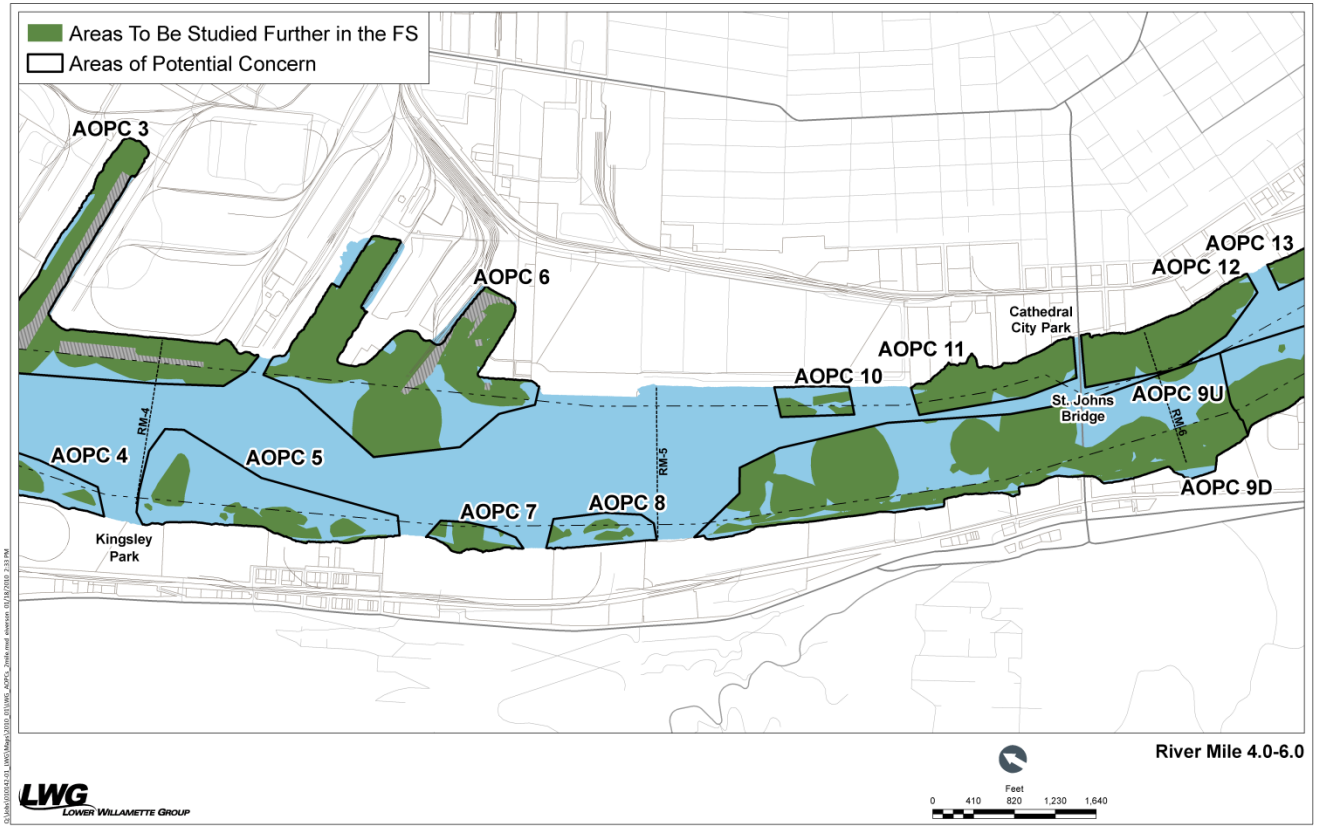
Draft EPA AOPC Map for Further Evaluation of RM 4.0 – 6.0



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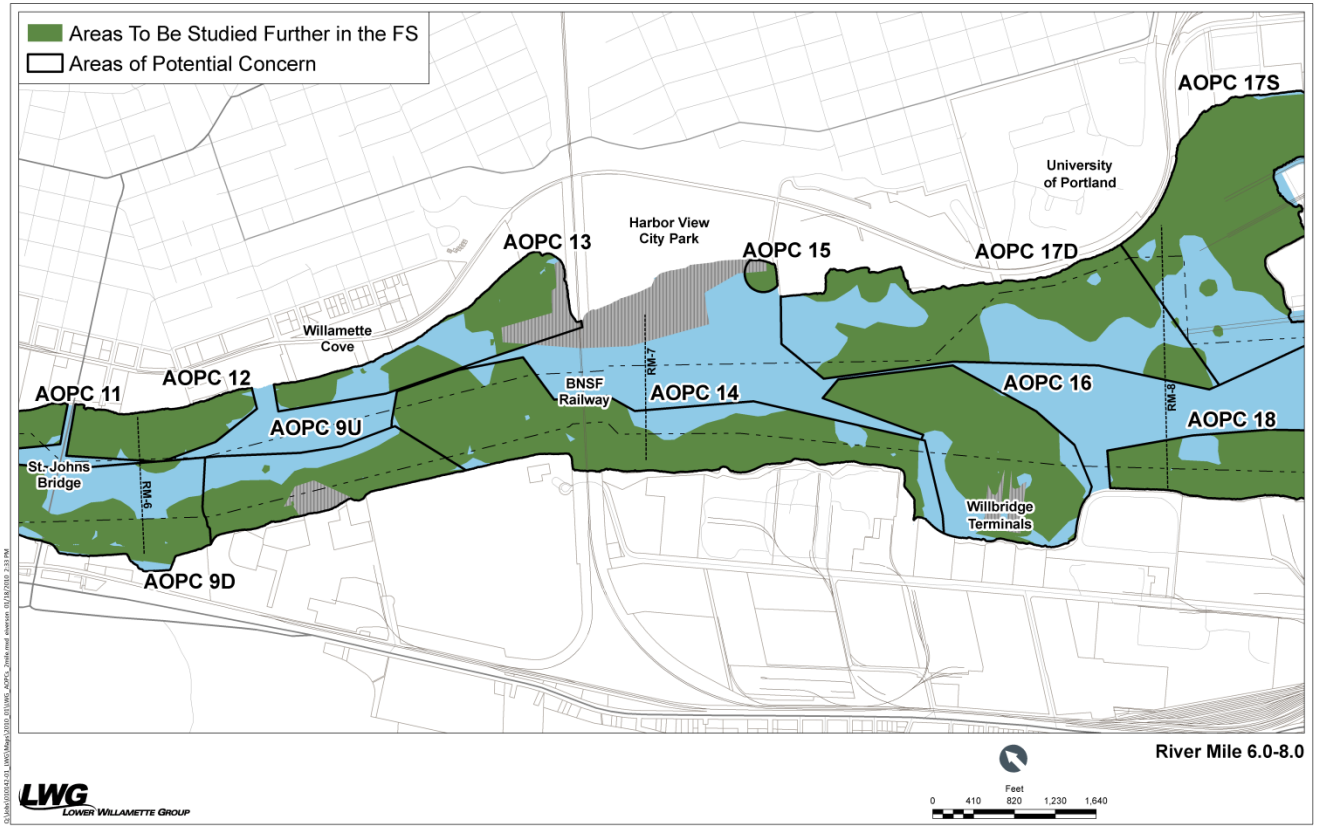
Draft EPA AOPC Map for Further Evaluation of RM 6.0 – 8.0



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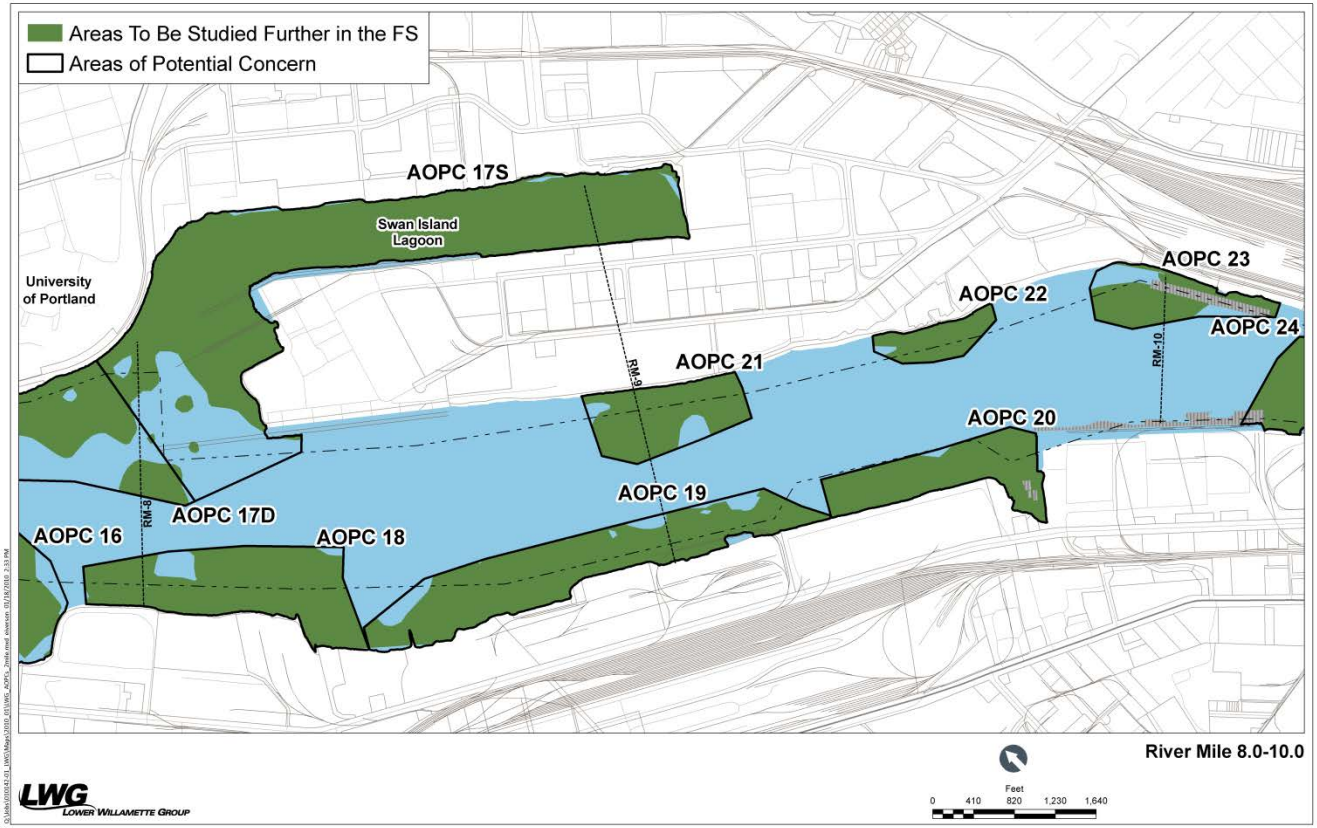
Draft EPA AOPC Map for Further Evaluation of RM 8.0 – 10.0



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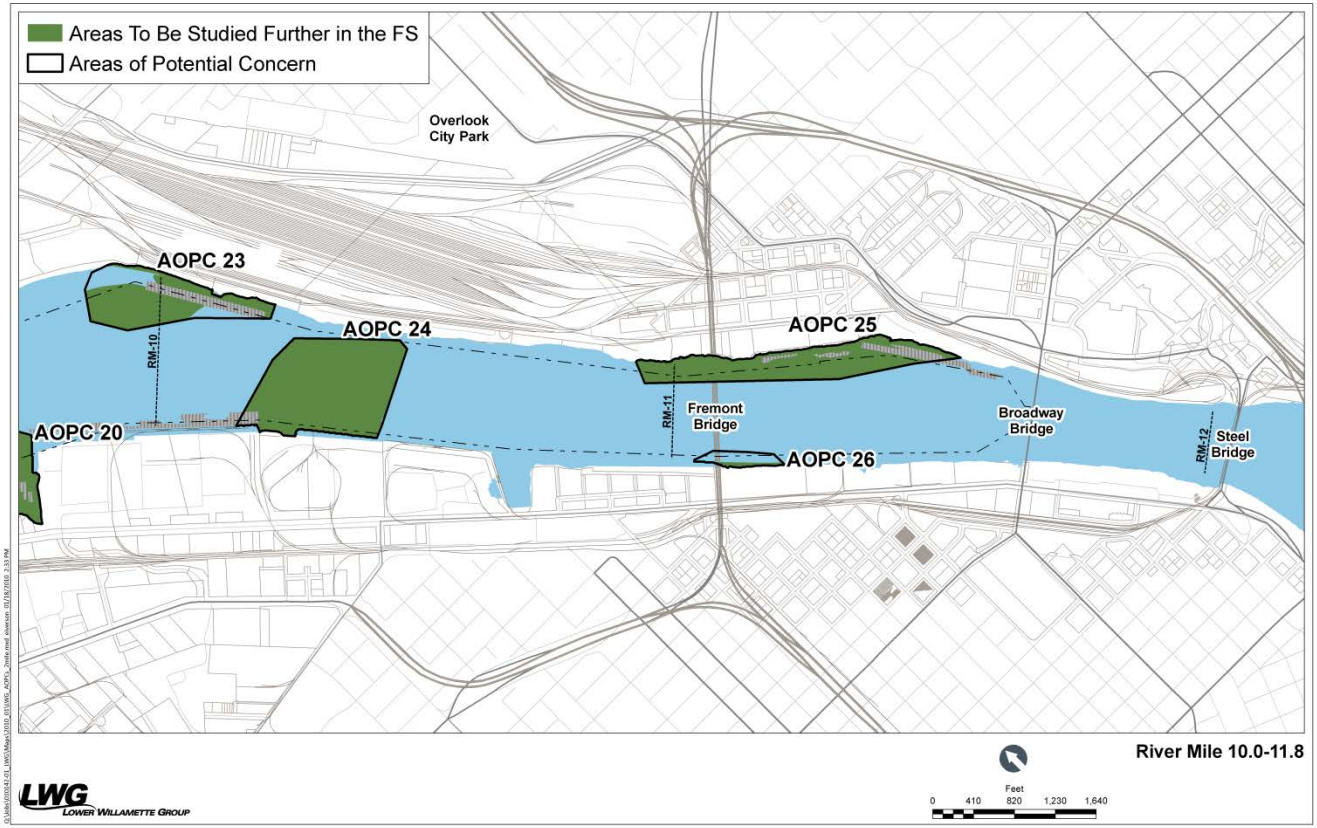
Draft EPA AOPC Map for Further Evaluation of RM 10.0 – 11.8



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AOPCs Lead to Sediment Management Areas

- SMAs are developed from AOPCs after evaluation of risk and non-risk factors.
- SMAs help organize large sites into manageable areas that can be evaluated and cleaned up individually.
- SMA development considers factors such as water dependent uses, navigation requirements, shoreline uses, future potential water/shoreline uses, habitat areas, potential habitat restoration areas, historic or ongoing sources, and others.

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ARARs - Applicable or Relevant and Appropriate Requirements

"Any standards or requirements promulgated under state or federal environmental law relating to hazardous substances that will remain on-site after the cleanup that are applicable to those substances or relevant and appropriate under the circumstances of the release"

- ARARs help EPA determine requirements of cleanup.
- Some ARARs help determine the site-specific cleanup goals (e.g. what the cleanup action must achieve – e.g. ppb, ppm, etc.).
- ARARs can be different for different media – e.g. sediment or water.
- ARARs can be state or federal laws or regulations.

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Most Common Remedial Options

- Dredging sediments and disposing of them in a confined facility such as a landfill
- Treatment – including innovative technologies – where chemical or physical processes are used to remove sediment chemicals or make them less toxic
- Capping sediments in place with clean sands or other clean materials to isolate them from the environment
- Monitored Natural Recovery, which is a process of monitoring a water body's ability to clean itself up through natural processes

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Alternatives Analysis

- In order to determine feasibility, remedial alternatives must be evaluated for effectiveness, implementability and cost.

- Criteria required under Superfund
  - Overall Protection of Human Health and Environment
  - Compliance with ARARs
  - Long-Term Effectiveness
  - Reduction of Toxicity, Mobility, and Volume through Treatment
  - Short-Term Effectiveness
  - Implementability
  - Cost
  - State
  - Community Acceptance

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Alternatives Analysis
Sediment Transport

- Sediments move due to river currents, waves, wakes, and propeller wash from vessels.
- Areas prone to erosion may uncover naturally buried contaminated sediments causing future risks.
- Areas of burial may be more amenable to certain types of cleanup technologies.
- Predictions of erosion are used to ensure capping and confined disposal options are stable and permanent.
- Hydrodynamic modeling, bathymetry observations, and propeller wash modeling are being further developed or have been conducted to address these issues for the FS.

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Alternatives Analysis
Contaminant Mobility

- Dredging – Will chemicals be liberated or lost during dredging? If so, what are their impacts?
- Disposal – Will chemicals be lost during disposal? What is the potential for long-term chemical migration or loss at the disposal site?
- Treatment – Will chemicals be lost during transport, handling, and treatment steps? What is the potential for long-term chemical loss at the treated sediment disposal/use site?
- Capping – What is the potential for long-term chemical migration from capped sites?
- Monitored Natural Recovery – Evaluated under chemical fate and transport modeling.

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Alternatives Analysis
Fate & Transport Modeling

- Will remediated areas be recontaminated due to ongoing sources? If so, to what level?
- Are decreasing chemical concentrations expected in certain areas (i.e., will areas recover through natural processes)?
- How do remedial alternatives compare in terms of sediment and water chemical concentration decreases over time?
- How do remedial alternatives compare in terms of eventual long-term chemical concentrations?
- How will chemical concentrations in fish tissue change due to remedial alternatives?

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Post RI/FS

- EPA prepares Proposed Plan after RI/FS and seeks public comment.
- EPA uses the Proposed Plan to develop a Record of Decision.
- EPA works with Responsible Parties to conduct Remedial Design for various SMAs.
- EPA works with Responsible Parties to conduct Remedial Action at various SMAs.
- EPA works with Responsible Parties to conduct Long Term Monitoring of the remedy to ensure its effectiveness.

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How Cleanup Goals are Achieved

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In closing…

- FS design and planning are underway between LWG and EPA/partners.
- FS expected to be complete around end of 2010 or early 2011.
- Public can review RI and keep informed.

www.epa.gov/region10/portlandharbor

Site Repository

St. John's Library

7510 N Charleston Ave

Portland, OR 97203

(503) 988-5397

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